

WHAT IS CLAIMED IS:

1 1. A method for increasing quality of an enhanced output signal to
2 approximate an undistorted sound signal, the method comprising steps of:
3 receiving a distorted input signal that includes an embedded corrupting
4 signal, wherein the embedded corrupting signal is statistically related to the undistorted
5 sound signal;
6 determining an enhancement signal by finding a difference between the
7 distorted input signal and the enhanced output signal, whereby the enhancement signal
8 attempts to offset the embedded corrupting signal;
9 analyzing the enhancement signal; and
10 producing the enhanced output signal, based at least in part upon the
11 analyzing step.

1 2. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 1, wherein:
3 the analyzing step comprises a step of determining a set of parameters
4 from the enhancement signal, and
5 the set includes a power of the enhancement signal, determined over a
6 finite-support window.

1 3. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 2, wherein possible values
3 for the power are constrained by characteristics of the distorted input signal.

1 4. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 2, further comprising a step
3 of increasing the periodicity of the distorted input signal.

1 5. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 1, wherein:
3 the analyzing step comprises determining a set of parameters from the
4 enhancement signal, and
5 possible values for at least some of the set are constrained by
6 characteristics of the distorted input signal.

1 6. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 1, further comprising a step
3 of increasing periodicity of the distorted input signal.

1 7. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 1, wherein the analyzing step
3 includes a step of feeding-back the enhanced output signal to affect determination of the
4 enhanced output signal.

1 8. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 1, further comprising
3 additional determining, analyzing and producing steps to iteratively refine the enhanced
4 output signal.

1 9. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 1, further comprising a step
3 of determining an amount of forward-in-time sample-sequences to use in determining the
4 enhanced output signal.

1 10. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 1, further comprising a step
3 of determining an amount of backward-in-time sample-sequences to use in determining
4 the enhanced output signal.

1 11. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 1, wherein the embedded
3 corrupting signal is introduced as an artifact of encoding and decoding of the undistorted
4 sound signal.

1 12. A computer-readable medium having computer-executable
2 instructions for performing the computer-implementable method for increasing quality of
3 the enhanced output signal to approximate the undistorted sound signal of claim 1.

1 13. A method for increasing quality of an enhanced output signal to
2 approximate an undistorted sound signal, the method comprising steps of:

3 receiving a distorted input signal that includes an embedded corrupting
4 signal, wherein the embedded corrupting signal is statistically related to the undistorted
5 sound signal;
6 estimating a first iteration enhanced output signal;
7 determining a first iteration enhancement signal by finding a difference
8 between the distorted input signal and the first iteration enhanced output signal;
9 analyzing the first iteration enhancement signal; and
10 producing a second iteration enhanced output signal, based at least in part
11 upon the analyzing step.

1 14. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 13, wherein:
3 the analyzing step comprises a step of determining a set of parameters
4 from the enhancement signal, and
5 the set includes a power of the enhancement signal, determined over a
6 finite-support window.

1 15. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 14, wherein possible values
3 for the power are constrained by characteristics of the distorted input signal.

1 16. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 14, further comprising a step
3 of increasing periodicity of the distorted input signal.

1 17. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 13, wherein:
3 the analyzing step comprises determining a set of parameters from the
4 enhancement signal, and
5 possible values for at least some of the set are constrained by
6 characteristics of the distorted input signal.

1 18. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 13, further comprising a step
3 of increasing periodicity of the distorted input signal.

1 19. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 13, determining an amount
3 of forward-in-time sample-sequences to use in determining the enhanced output signal.

1 20. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 13, determining an amount
3 of backward-in-time sample-sequences to use in determining the enhanced output signal.

1 21. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 13, wherein the embedded
3 corrupting signal is introduced as an artifact of encoding and decoding of the undistorted
4 sound signal.

1 22. The method for increasing quality of the enhanced output signal to
2 approximate the undistorted sound signal as recited in claim 13, wherein the first iteration
3 enhancement signal and the second iteration enhancement signal correspond to a same
4 portion of the undistorted sound signal.

1 23. A computer-readable medium having computer-executable
2 instructions for performing the computer-implementable method for increasing quality of
3 the enhanced output signal to approximate the undistorted sound signal of claim 13.

1 24. A sound enhancement system that improves a distorted input signal
2 to produce an enhanced output signal where the distorted input signal includes an
3 embedded corrupting signal, wherein the embedded corrupting signal is statistically
4 related to an undistorted sound signal, the sound enhancement system comprising:
5 an enhancement circuit that receives the distorted input signal and
6 produces a first iteration enhanced output signal;
7 a feedback circuit that uses the first iteration enhanced output signal to
8 effect production of a second iteration enhanced output signal by the enhancement circuit;
9 and
10 an output circuit that produces the enhanced output signal upon completion
11 of at least one iteration cycle.

25. The sound enhancement system that improves the distorted input signal to produce the enhanced output signal where the distorted input signal includes the embedded corrupting signal introduced as the artifact of encoding and decoding of the undistorted sound signal wherein the embedded corrupting signal is statistically related to the undistorted sound signal as recited in claim 24, wherein:

a set of parameters is determined from the enhancement signal, and
the set includes a power of the enhancement signal, determined over a finite-support window.

26. The sound enhancement system that improves the distorted input signal to produce the enhanced output signal where the distorted input signal includes the embedded corrupting signal introduced as the artifact of encoding and decoding of the undistorted sound signal wherein the embedded corrupting signal is statistically related to the undistorted sound signal as recited in claim 25, wherein possible values for the power is constrained by characteristics of the distorted input signal.

27. The sound enhancement system that improves the distorted input signal to produce the enhanced output signal where the distorted input signal includes the embedded corrupting signal introduced as the artifact of encoding and decoding of the undistorted sound signal wherein the embedded corrupting signal is statistically related to the undistorted sound signal as recited in claim 24, wherein the periodicity of the distorted input signal is increased by the enhancement circuit.

28. The sound enhancement system that improves the distorted input signal to produce the enhanced output signal where the distorted input signal includes the embedded corrupting signal introduced as the artifact of encoding and decoding of the undistorted sound signal wherein the embedded corrupting signal is statistically related to the undistorted sound signal as recited in claim 24, wherein the embedded corrupting signal is introduced as an artifact of encoding and decoding of the undistorted sound signal.

29. The sound enhancement system that improves the distorted input signal to produce the enhanced output signal where the distorted input signal includes the embedded corrupting signal introduced as the artifact of encoding and decoding of the undistorted sound signal wherein the embedded corrupting signal is statistically related to

